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Several factors, including decentralized organization and local autonomy, have resulted in the United States having 27 different training and education programs to meet national needs and functions of the central government; however, the public schools are the chief source of such formal job training. Vocational education is an integrated part of state and local programs but has been partially financed federally since the enactment of the Smith-Hughes Act of 1917. The states each must submit a state plan to the U.S. Commissioner of Education outlining their vocational education programs. Apprenticeship programs are operated voluntarily by firms or trade unions in cooperation with the U.S. Bureau of Apprenticeship and Training. A wide variety of on-the-job training is available through many types of employers and is generally considered the most effective type of company training. Technical education is often offered at post-secondary technical institutes or junior colleges. Some of these schools date back over 100 years and many are proprietary in nature. Since 1960, training has come to be viewed as means of overcoming social and economic problems and is used to encourage economic development. Various legislation is discussed and national enrollment data are presented in tabular form. (EM)

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THE STRUCTURE

of

TECHNICAL TRAINING ADMINISTRATION

in

THE UNITED STATES.

PREPARED BY THE OFFICE OF MANPOWER POLICY, EVALUATION AND RESEARCH, U.S. DEPARTMENT OF LABOR FOR THE
PAN INDIAN OCEAN CONFERENCE ON TECHNICAL EDUCATION AND TRAINING
PERTH, 1966

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1. Introduction

Our society has stressed education and training as a means for attaining the life that we desire. There is a close correlation between training for work and the educational attainment of the individual. Each person, however, is free to receive training or abstain from training because individual freedom also implies freedom from work and freedom from training—although such abstinence can only be purchased at an economic and social cost to the individual and society. Training for work, therefore, is not compulsory; education generally is compulsory through age 16.

There is a great variety of job training in the United States, largely the result of a system that places the primary responsibility for training on the individual. This system often confuses a person from outside the United States who attempts to understand the organization and administration of job-training within our country. Job training thus appears disorganized and haphazard, but in reality the individual has many opportunities to choose from many types and sources of training.

The major responsibility for job training in the United States rests with the individual receiving and benefiting from the training. Nevertheless, the burden for organizing, conducting, and developing training cannot be borne by the individual alone. Therefore, we have developed many means for training people for the world of work. The public school system in the United States forms the core around which most of the job training is centered. It is necessary to understand the structure of our public school system to understand the administration of job training.

Public education in the United States is historically and constitutionally a function of the State and local governments. We do not have any centralized educational administration in the United States, each State having its own education system. The control, direction, and financing of public schools are vested largely in the local communities, counties, and municipalities according to varying State laws. Our Federal Government, which is headquartered in Washington, does not operate the public schools and influences public education only indirectly through public expenditures. Federal expenditures in the education field have been selective and limited.

Under our Federal system of government, certain powers are granted to the Federal Government and others reserved to the States. This dual structure of our government influences the organization and structure of most of our institutions for

manpower development and utilization. The basic public education systems have been created and developed by the States and local communities. However, by 1965 there were some 27 different training and education programs[1] to meet national needs and to carry out functions granted to the central government with Federal financing of those being trained. Free choice of the individual is one of the chief principles of Federal as well as State and local programs of manpower training and development. Freedom of individual choice means more than freedom to choose between training and no training. It also means choice between types of courses and training objectives. It means that the individual will continue to have choices of training and freedom to change and alter his job career at numerous stages of his development. A decision regarding training and a career made at one point in life does not foreclose changing a career and pursuing another line of training at a later date. Furthermore, free choice of training would be meaningless unless there were opportunities for employment of the skills and knowledge after the training is completed. Therefore, meaningful job training implies a full employment economy with job opportunities for all who choose to apply their skills and knowledge. Our manpower development programs, therefore, are knitted together in an active manpower policy that looks toward providing each individual with a full opportunity to use his capacities in employment which satisfies him personally and contributes generally to the quality of the Nation's life.

Another reason for the apparent disorganization and haphazard arrangement of job training in the United States is the size of the labor force and the dynamic momentum of the economy. The total labor force of the United States in 1965, numbered over 78 million. For the year 1965, some $4\frac{1}{2}$ percent of our labor force were unemployed, making for one of our major social and economic problems. Despite this unemployment rate, which had been reduced to 3.7 percent by April, 1966, the economy was producing goods and services at a rate of over $700 billion annually in the early part of 1966. The number of wage and salary workers on nonagricultural payrolls rose almost 3,000,000 between April, 1965 and April, 1966, indicating a dynamic and expanding economy. A single or simple system of training persons for work could hardly meet the needs of this rate of growth.

At the outset, it should be made clear that formal training for work is not obtained by, or required of, all workers. A 1963 study[2] found that although a majority of the workers with training were using it on the job, not quite half of

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[1] Federally-Assisted Manpower Development Programs, Manpower Administration Planning Staff Study, 1965.
[2] Formal Occupational Training of Adult Workers, Manpower/Automation Research Monograph No. 2, December, 1964.

the work force had formal training. Most of the workers covered by that survey had just picked up the necessary skills or had developed them through informal on-the-job training and experience. Some workers use a combination of methods in learning their jobs. In this survey, only eight percent of the workers said no training was needed for their job and about 30 percent had learned their jobs through formal training. The informal methods of learning jobs applied to the majority of the labor force.

Since the public schools are the chief source of formal job training in the United States, those without high school education lack the opportunities for vocational training. Not only do the high schools play an important role in providing occupational training in the United States, but frequently a high school education is required for admission to industry training programs and influences the selection for training programs in the military services. The correlation between educational attainment and job training is further illustrated by the following data from the 1963 survey. Of the workers with less than three years of college education—

32 percent had no more than an eighth-grade education—one sixth of these had job training;

23 percent had some high school but had not graduated—nearly half of these had job training;

35 percent were high school graduates but with no college education—two-thirds of these had job training;

9 percent had 1 or 2 years of college—three-quarters of these had job training.

2. Vocational Education

Vocational education in the public schools is the chief source of formal job training in the United States. Administered by the State and local governments, vocational education has received important financial support for more than 50 years, from Federal appropriations. Vocational education is an integrated part of the large State and local educational and training program. The vastness of the U.S. education program is illustrated by the following statistics: about 54 million persons, 5 to 34 years old were enrolled in school or college in 1965. Approximately 32.5 million youngsters were going to elementary school (grades 1 to 8); another 13 million were enrolled in high school (grades 9 to 12); and about 5.7 million were attending college and professional school; 2.6 million children were in kindergarten. Enrollment in federally-aided vocational classes, exceeded 4.5 million, which are included in the above numbers. (See Appendix Table 1 for the enrollment by types of programs in selected years.

Federal aid to the States for vocational education commenced with the enactment of the Smith-Hughes Act of 1917 which authorized the appropriation of over $7 million annually. Under this Act, funds were allotted to the States for agricultural education, trade, home economics, and industrial education, and for teacher training in these subjects. For many years, Federal funds were limited to these subjects. In 1946, the George-Barden Act was passed auhorizing the appropriation of $28.5 million annually for allocation to the States for vocational education, and education for distributive occupations was added to the authorized training subjects. In 1956, fishery trades and industries and practical nurse training were added to the vocational categories. In 1958, the authority for vocational education expenditures was extended by the National Defense Education Act to include highly skilled technicians. The distribution or allotment of funds to the State and local governments was on a clear cut basis without much discretion left to the central authorities in the U.S. Office of Education in the administration of these funds.

Until the 1958 legislation, the vocational education program concentrated on secondary education or the high schools. The National Defense Education Act encouraged post-secondary vocational education. In recognition of the rapidly rising demand for scientific and engineering technicians, the 1958 legislation authorized Federal aid for programs designed to prepare highly skilled technicans in occupations necessary for national defense. Another important innovation of this act was a requirement that the training be given in area programs open to students of more

than one school district. This recognized the difficulty and cost of providing a wide variety of skill training programs to a limited geographical area. Experience with the area programs has provided guidelines for a greatly expanded program of construction of area vocational schools in recent years.

The contribution that States and communities have made to the vocational education program cannot be overemphasized. Federal funds for the various categories of training have always been more than matched by funds from State and local sources.[3] In addition, high schools throughout the country have offered programs of business and commercial education, financed wholly from State and local funds. These programs have been the largest source of formal occupational training for girls and have prepared thousands of boys for business jobs.

The kinds of vocational courses offered in each State bear relationship to the character of the State's industries and their employment requirements. The States where trades and industry programs have been relatively largest, for example, are Connecticut and New Jersey, both heavily industrialized States with a concentration of the population in large industrial centers. In these States, trades and industry enrollment represented well over half of all vocational education enrollment in 1963; another fifth of the total in technical education. The States with the highest proportion of enrollment in vocational agriculture for example were Mississippi, Iowa, Oklahoma, Alabama, Texas, South Carolina, and South Dakota. In rural areas in these and other States, the schools have offered boys vocational preparation chiefly or exclusively in agriculture despite the continuing sharp decline in farm employment and the consequent movement of population to urban areas and nonfarm occupations.

This problem of limited vocational education offerings in small communities was not restricted to agricultural States. School districts outside big cities and suburban areas were seldom able to afford broad and varied vocational education programs. Young people in small towns and farming areas had a need for more well rounded programs of vocational education including training for nonfarm jobs.

Deficiencies in the vocational education program led to our latest legislation in the Vocational Education Act of 1963. Vocational education in the United States is being expanded and strengthened by changes provided under this legislation. The new act was the outcome of a comprehensive study by a Panel of Consultants appointed at the request of President Kennedy. In a 1961 Message to the Congress

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[3] Manpower Report of the President, 1965, pp 97 ff.

he pointed out that technological changes in all occupations called for a review of the existing vocational education programs. The Panel had responsibility for conducting this review and for making recommendations for improving and redirecting the program.

One of the major findings in the Panel's report, issued after a year of intensive research and consultation, was that opportunities for vocational education were far from sufficient either to serve the youths and adults currently in need of training or to meet the projected needs of the labor force and should be carefully correlated with these requirements.

Greatly increased Federal aid was recommended to permit expansion of vocational education at all levels. The Panel also recommended the strengthening of many services that make instructional programs more effective—including teacher education, occupational information and vocational guidance, evaluation and research, and the need for more information on the placement of vocational students after graduation.

The Vocational Education Act of 1963 follows with the Panels' recommendations and provides the means for implementing them. The philosophy of the act is that all citizens—from the least able and the disadvantaged to those with a high level of technical ability—should have access to quality education and training, which is realistic in terms of employment opportunities.

The Vocational Education Act of 1963 provided funds for strengthening, improving and expanding existing programs of vocational education, for developing new programs, and for part-time employment of young people lacking enough money to continue their vocational education. Vocational education was broadly defined in the 1963 act, but was not stretched to include education for a profession. Four categories of persons were named as eligible to receive vocational education:

1. Persons attending high school;
2. Persons who have completed or left high school, but are free to study full-time in preparing for a job;
3. Persons who have already entered the labor market but need training or retraining to hold their jobs or to get ahead; and
4. Persons who have handicaps that prevent them from succeeding in regular vocational education programs.

The Vocational Education Act of 1963 reserved 10 percent of the funds appropriated for the U.S. Commissioner of Education to use as grants for research or experimental pilot projects. It authorized the use of funds for the construction of area school facilities that would serve more than one school district. The 1963

act also required the States to use at least 25 percent of their funds either for construction of area schools or for education of persons who have graduated or dropped out of high school and are free to study full time in preparation for a job. The percentage for these purposes was 33 1/3 through fiscal year 1968. This requirement placed greater stress on training adults for work and on the development of schools that would serve several communities.

To be eligible for participation in the programs provided for by the act, each State must submit a plan for participating in the program through the State board of vocational education, to the U.S. Commissioner of Education.[4]

The plan for the program must do these things:

(1) Designate the State board as the sole administrator of the plan or as the supervisor of the administration of the plan by local educational agencies.

(2) Set forth the policies and procedures the State will follow in allocating Federal funds to local educational agencies. These policies and procedures insure that local vocational education programs will be evaluated periodically and the results considered in the light of manpower needs and job opportunities.

(3) Set minimum qualifications for teachers, teacher trainers, supervisors, and others responsible under the plan.

(4) Provide for cooperative arrangements by which employment offices would give State and local educational agencies the information they need in counseling students and in deciding what occupations to train.

(5) Describe procedures for disbursing and accounting for funds.

(6) Obligate the State to comply with labor standards.

(7) Obligate the State to make the reports the Commissioner needs in administering the act and to give him access to State records if he finds it necessary to verify the accuracy of the reports.

If the State plan meets all these conditions satisfactorily the Commissioner will approve it; if it does not, he must give the State board reasonable notice and an opportunity for a hearing before he disapproves it.

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[4] Office of Education, "The Vocational Education Act of 1963", OE 80034.

The Office of Education, through the Division of Vocational and Technical Education, provides assistance to the States in coordinating efforts in teacher education, research relating to training needs, and expanding counseling and guidance services. Most noteworthy have been Office of Education efforts in developing instruction methods and curriculum materials.

With the emergence of new occupations and the development of many training programs in recent years, there has been increased emphasis on development of many training programs in recent years, there has been increased emphasis on development of new curriculum guides and training materials. Office of Education specialists in the various fields of vocational education have cooperated with the States in planning a variety of instructional materials.

The Division of Vocational and Technical Education has developed, during the past few years, close working relationships with a number of other Federal agencies, not only within the Department of Health, Education, and Welfare, but with other executive departments.[a]

Preparation of curriculum guides and suggested techniques for program development often involve specialized assistance from outside the field of vocational education. Assistance to the States in planning new programs to meet changing needs in the labor market is increasingly prefaced by consultants with specialists representing a number of different agencies.

Some illustrations of Federal activities to strengthen vocational education:

1. Distributive education specialists have cooperated with specialists in the Small Business Administration and the Department of Commerce in helping to plan programs in small business management and in export trading.
2. The Office of Vocational Rehabilitation has involved the Division of Vocational and Technical Education in such efforts as development of special training to help the physically handicapped become successfully self-employed.
3. A joint committee representing several offices of the Department of Agriculture and the Division of Vocational and Technical Education, is currently working out plans for increasing cooperation between the two agencies in rural areas, and is examining employment opportunities deriving from agriculture.

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[a] Office of Education, "Vocational and Technical Education", OE 80008-63.

4. Close working relationships have been developed over the past several years between specialists in education for the health occupations, staff of the U.S. Public Health Service, and organized groups representing the various health professions.

The Office of Education has played a major role in developing guidelines for preparing curriculums for technical training courses. This central office in the Federal Department of Health, Education, and Welfare provides the point for interchange of information of new innovations and new course developments. Criteria for identifying technical occupations that require training and the general abilities required for specific types of jobs have been developed by the Office of Education. These standards and the research of the Office of Education provide the basis for new institutions to determine the type of vocational curriculum needed. The guidance and technical assistance made available to local communities by the central Federal office is an important contribution to the progress and development of vocational education.

3. Apprenticeship

Apprenticeship has been traditionally considered the best way of training craftsmen. Today apprenticeship calls for a combination of practical on-the-job training and formal classroom instruction to provide the broad theoretical background and practical skills needed to understand and perform the work of the particular craft.

Between 150,000 and 200,000 persons are in training under registered apprenticeship programs in the United States at any given time. Despite the number in apprentice training, the data indicates that most craftsmen pick up their skills without a formal training program. Since 1960, for example, employment for craftsmen has been increasing at about 100,000 annually while less than 30,000 registered apprentices have been completing their program annually. Appendix Table 2 shows the trends in training of registered apprentices since 1941.

Of the 159,000 apprentices registered and in training at the end of 1962, about two-thirds were in the construction trades. In the metalworking trades there were 23,538 registered apprentices, about 15 percent of the total. The printing trades accounted for 12,768, or about 8 percent of the total. The remaining 19,264 apprentices were scattered through many occupations and industries. Two of these, which apparently have rather substantial numbers of apprentices, are barber and beauty shops and auto repair shops.

Apprenticeship programs in the United States are almost entirely voluntary, being conducted either by firms or by agreement between firms and trade unions. The function of government, State and Federal, is limited to encouraging the development of such programs and to providing research and other technical assistance in establishing such programs.

The basic Federal statute under which apprenticeship standards are established and assistance provided is the Fitzgerald Act of 1937. The Bureau of Apprenticeship and Training of the U.S. Department of Labor has been established to carry out the act's functions and is advised on policies by the Federal Committee on Apprenticeship. In addition, 29 States, the District of Columbia, and Puerto Rico have statutes. The standards established under State and Federal laws are not mandatory and the functions of the governmental agencies in this field are primarily promotional. No direct financial aid is provided by the Federal Government.

One general effect of the Fitzgerald Act has been to restrict occupations considered apprenticeable to those approved by the Federal Committee on Apprenticeship. Apprenticeable occupations include those customarily learned

through 2 or more years' training and work experience on the job that are clearly identifiable and commonly recognized throughout industry. Occupations considered not apprenticeable include (1) selling, retailing, or similar occupations in the distributive field, (2) managerial occupations, (3) clerical occupations, (4) professional and semiprofessional occupations and (5) agricultural occupations. In some States, however, occupations not considered apprenticeable under Federal standards are considered apprenticeable by the State apprenticeship body. The U.S. Department of Labor, however, requires that certified apprentices be paid at rates meeting Federal standards.

The Federal Committe on Apprenticeship has recommended that an effective apprenticeship program should contain provisions for the following:[6]

1. The starting age of an apprentice at not less than 16 years.
2. An established schedule of work processes in which the apprentice will receive instruction and experience on the job.
3. Organized instruction to provide the apprentice with knowledge in technical subjects related to his trade with 144 hours annually normally considered necessary.
4. A progressively increasing schedule of wages.
5. Proper supervision of on-the-job experience with adequate facilities to train apprentices.
6. Periodic evaluation of the apprentice's progress both in job performance and related knowledge, and the maintenance of appropriate records.
7. Employee-employer cooperation.
8. Recognition for successful completions.
9. Selection of men and women for apprenticeship without regard to race, creed, color, national origin or physical handicap.

The formulation of training programs is left to the firms or the joint labor-management committees. In most cases the general standards are contained in a particular union contract. In some cases, however, national standards have been worked out in accordance with the national apprenticeship standards mentioned before. At present such standards are to be found in bricklaying, carpentry, cement masonry, asphalt, and composition trade, auto glass installation, drafting, electrical contracting, glasswork, painting, decorating and paperhanging, photoengraving, plastering, stained glass, and sheet-metal work.

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[6] U.S. Senate Committee on Labor and Public Works, *The Role of Apprenticeship in Manpower Development: United States and Western Europe, 1964.*

The training pattern normally requires a certain number of hours spent in work of a certain character. Provision is made for the progressive development of skills by the apprentice and for instruction in all branches of the trade during the course of training. Recommendations are usually made for recording the progress of the apprentice and for submitting his records to the joint committee. There is, however, no real checkup by any responsible national authority of the extent to which training is actually received. In many trades there are no general standards and few joint committees. Thus the quality of training for apprentices varies greatly from firm to firm and trade to trade.

Although a high school education increasingly is becoming a requirement for admission to an apprenticeship program, it is not universally required.

The standards set up, call fairly uniformly for a minimum of 144 hours of related training. Such training is provided almost always in evening classes at vocational schools. Some apprentices are paid for attending this training; some are not.

Related training commonly includes courses in mathematics, science, and blueprint reading. Training in such matters as safety practices, use of tools, and trade procedures are taught frequently in night school, rather than on the job.

Apprentices may be required to keep records of the training received. The joint committees usually review the reports on training received from the firms. They also examine the apprentices themselves, either periodically, to assure that training is proceeding properly and that the apprentice is being paid the agreed rate, or at the end of the apprentice period.

It is customary to award apprentices a certificate on completion of their training. These certificates are requested by the committee from the State apprenticeship agency or the Bureau of Apprenticeship and Training.

Unions have given more attention to apprenticeship programs than any other group in the United States. The interest of the unions is in maintaining wage levels and the quality of work in the trade and, more remotely, in controlling the number of skilled workers in the trade—not much of a problem because employers have been reluctant in many instances to hire apprentices. With few exceptions, the printing trades and the diesinkers, for example, actual restrictions by unions on the number of apprentices have been rare. In fact, unions often have taken the lead in encouraging employers to set up apprentice programs to assure a flow of properly qualified workers into the trade and provide some means of controlling that flow.

Union sponsorship of apprenticeship programs is particularly prevalent in the construction trades, where programs that exist are generally joint programs of unions and management. In the metal trades, on the other hand, relatively few programs are union sponsored and many unregistered programs are handled entirely by the firm. Employers have more frequently favored skill upgrading or other informal means by which workers secure skills without any direct, obvious cost to the employer.

The comparatively unimportant role played by apprenticeship in the United States suggests that employers do not generally consider that they benefit from it. Indeed, the evidence indicates that, in general, the demand for apprenticeship training far exceeds available openings. Since management seems willing to accept and make use of the informal upgrading systems through which most skilled workers obtain their skill, it seems unlikely that economic demand factors will alter the present practice in the near future.

Apprenticeship programs are actively promoted at all levels of industry through a variety of techniques.

At the national level, Bureau of Apprenticeship and Training representatives work directly with officials of management and labor organizations to obtain policies favorable to the establishment of new apprenticeship programs by affiliated local organizations and to improve existing ones. Industrywide joint labor-management committees and national apprenticeship standards have been established for 24 major trades; 30 other national employer associations and international unions have been encouraged to adapt unilateral policy statements on apprenticeship for the guidance of local groups. Allied to national level promotion are projects where special promotional and factfinding efforts within selected industries for specific periods are pursued. Normally, three such projects are active each year and are given publicity and support by the affected industry organizations. Extensive use of national trade journals is made to publish research and technical studies, information on training procedures, and to publicize outstanding programs.

The major promotional effort is with the individual employer association, and local labor union. Field representatives contact directly the persons responsible for and capable of providing training opportunities. Initial consultations or training or promotional visits to establishments not previously contacted totaled 7,600 in fiscal 1963. During that year about 1,200 new apprenticeship programs were established. By promotion, persuasion, and technical assistance to existing program sponsors about 2,000 significant improvements in the administration, operation, trade coverage, and extent of employer participation, were obtained in fiscal 1963. Promotion is obtained through providing leadership and assistance in the organization and conduct of statewide and multistate apprenticeship conferences.

General promotional efforts to bring about an awareness of the need for planned manpower development also proceed at community levels. Bureau of Apprenticeship and Training representatives make use of booklets, reprints, research studies, national standards, and policy statements. Special promotional tools are employed such as exhibits, desk easels, films, and film strips.

The Bureau of Apprenticeship and Training field staff has successfully promoted areawide apprenticeship programs particularly adapted to the needs of the small employer. Such programs, common in the construction industry, permit a combining of resources for well-developed training programs and provide more apprenticeship opportunities and greater continuity of employment. Areawide programs are administered by joint labor-management committees. Another development, resulting from the Bureau of Apprenticeship and Training promotional efforts, has been the establishment of industry training trust funds. Apprenticeship training directors serve as valuable "multipliers" of the Bureau of Apprenticeship and Training promotional efforts.

4. Skill Development on the Job

One of the major sources of job training in the United States is the private sector of the economy. Astonishingly little is known, however, about industry's contribution to the skills of the work force.

A 1963 study of formal occupational training[7] found that almost half of the work force had no formal training. Most of these workers had just picked up the necessary skills or had developed them through on-the-job training and experience. Some workers reported they acquired job skills through a combination of these informal methods together with formal job training.

In the 1963 study, 56 percent of the workers reported on-the-job learning, including instruction from supervisors or fellow workers, "working their way up," and company training courses. About 45 percent of the workers reported that they learned the job by casual methods, that is from friends or relatives or similar informal methods.

Unfortunately, it is difficult to distinguish between training, which refers to development in the worker of definite skills and abilities which are necessary for the successful performance of his present or prospective job, and educational activity not directly related to job performance.

The wide variety of training provided on the job is difficult to imagine. On-the-job training is better adapted to certain occupations and industries than others. For example, professional and technical workers most frequently learn the basic job requirements through formal training, supplemented by on-the-job training. The professions, of course, are dominated by college graduates. Other occupations such as draftsmen, practical nurses and barbers depend heavily on formal training for their basic skills. Clerical workers are another occupational group that rely on formal training for much of their skills. Trades and service workers and managerial personnel receive more training on the job. Appendix table 3 shows the distribution of the ways of training and the most helpful way of learning different occupational groups.

Although there is no comprehensive evaluation or census of the contribution of private enterprise to job training, there are a number of selected studies of the training activities of groups of companies. The large companies generally support

[7] Formal Occupational Training of Adult Workers. Manpower/Automation Research Monograph No. 2. December, 1964.

more formalized training programs. A survey of 426 manufacturing companies in 1964[8] found that 45 percent conducted formal training programs for employees. Only 30 percent of the companies with less than 500 employees had formal training programs whereas 83 per cent of the companies of over 5,000 employees had formal training. Thirty percent of the companies had formal training programs for both white collar and blue collar employees, 7 percent limited their training to white collar workers, and 8 percent to blue collar workers. Many companies provide tuition aid and other encouragement to employees to take course work in outside educational institutions. Of the 426 manufacturing companies surveyed, 65 percent provided tuition aid to employees taking courses in outside institutions. A similar survey of insurance companies, banks, utility companies, and establishments in retail and wholesale trade found that a majority of companies provided tuition aid to employees. There was great variation between companies concerning rules and regulations for the provision of tuition aid.

Since company training is the responsibility of the company and the individual, there are great variations in the way training is organized. In a 1962 study of 114 companies,[9] slightly more than half considered training to be a staff function, 41 percent considered it a line function, and 7 percent as a joint line-staff job. The same study found that the most common way of determining the needs for training was observation and analysis of job performance. The study indicated that it was the responsibility of line management to determine training needs in 44 percent of the companies. Job training was found to be given on company time in about 80 percent of the companies and four out of five companies paid employees for after hours training.

U.S. companies use a number of means for training employees, but on-the-job training is generally considered to be the most effective. Company training is not only designed for skill improvement but frequently involves retraining of persons whose skills have become obsolete. Devices used are lecture or classroom method, job rotation, conferences, case methods, role playing, vestibule training, and job enlargement. Company training is often the most advanced in techniques and in the use of training aids. Companies also make extensive use of outside specialists in the conduct of training programs. Colleges and universities provide instructors for company training. In addition the suppliers of equipment and private consultants provide an outside resource.

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[8] National Industrial Conference Board, "Personnel Practices in Factory and Office: Manufacturing Studies in Personnel Policy No.194", 1964.

[9] Bureau of National Affairs, Inc. "Personnel Policies Forum No. 66", 1962.

The wide variety of training available in the United States emphasizes the basic philosophy that training is an individual responsibility. Manpower training confers immeasurable overall social benefits that contribute to economic development and from which the rewards are shared indirectly by the entire society. Therefore, many difficult policy decisions must be made regarding the extent to which training costs should be shared by individuals, enterprises, and society in general. An investment in specialized occupational training can more readily be realized by an individual who expects to gain a better income for himself or by a commercial enterprise which requires particular skills for viable production and will reap a return on human resource investment in the form of profits from increased output.

5. Technical Training and Technical Institutes

The institution most directly related to the training of technicians is the technical institute. These institutes are generally identified with the training of scientific and engineering technicians. The concept of a technical institute applies to a type of education and to an educational institution,[10] and these concepts may be frequently intermixed. As a type of education it comprises study and its direct application to life. Identified as a program of study, the person pursuing this program follows an orderly sequence of subject matter to become prepared for productive and gainful employment. In the context of a type of education, the technical institute may provide training to lawyers or nurses as well as engineers. It may be a course of study provided by a public school, college or private institution which may also offer other education and training or it may be restricted to a single purpose.

When the term technical institute is applied to an educational institution, it may refer to many kinds of organizational and administrative structures. In this sense, the term originated with a single purpose school operated exclusively for educating technicians. This independent institution separate from other types of programs is often considered most appropriate for job training because of its singleness of purpose enabling it to drive directly toward its goal. Reflecting the need for well educated technicians, some of the technical institutes in the United States date back more than 100 years. Some of the technical institutes have become engineering colleges and universities while others have remained as a distinct and rather independent part of our educational and training system. The high grade of instruction provided by the technical institutes and their independence have provided much of the pioneering experimentation in technical training in the United States. Although lacking unity in organization, curriculums and methods, some general characteristics of the technical institutes have been identified as follows:[11]

1. It is post-secondary level, but distinct in character from a college or university.
2. Its objective is to prepare persons for technician occupations, which lie between the skilled crafts and the engineering profession. Its curriculums are largely of engineering technician type, but some may be included which prepare for occupations of industrial technician type or technical specialist type.

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[10] Granery, Maurice F., *The Technical Institute,* The Center for Applied Research in Education, New York, 1964.
[11] Emerson, Lynn A., *Technical Training in the United States, June, 1964.*

3. Its full-time curriculums are usually 2 years in length. Some curriculums may be 1 year or so in length, but such programs are rare.

4. Its entrance requirements are somewhat more flexible than those of the engineering college. High school graduation or equivalent preparation is usually required, but frequently there is no specification of the types of high school courses required as prerequisites.

5. Its methods of teaching are relatively direct, with a strong emphasis on doing, and somewhat less stress on extensive book study than is found in the engineering college.

6. Its curriculums usually provide a reasonable amount of manual and other skill training, as well as the development of technical knowledge and understanding and technical skills.

7. Its curriculums are aimed to prepare persons for clusters of closely related technical occupations in selected fields, in contrast with the broad scope of engineering programs, or with the narrow scope of skilled craft training.

8. The number of contact-hours spent by the student in classroom, laboratory, drafting room, and shop is usually higher than that of the engineering college, and in this respect its pattern is more like that of a vocational-industrial school.

9. Its curriculums may include varying percentages of general education in such fields as economics, sociology, and human relations. Most curriculums provide for the development of skills in oral and written communication.

10. Its curriculums are developed through analysis of the occupational activities that are set up as employment objectives. These may vary in different localities; thus the curriculums are less standardized than are engineering curriculums. The analysis procedure usually takes the form of an activity analysis of the occupations in the cluster set as the curriculum objective, and often includes analysis of the mathematics and science needed for the occupations.

11. Its teachers are chosen primarily on the basis of practical experience in technical occupations, applied technical ability, and personal qualities, rather than on scholarly preparation. In this respect it resembles the vocational-industrial school more closely than the engineering college.

12. Many of the students enter the technical institute after they have had some work experience, and are thus more mature than those entering higher educational institutions directly from high school.

13. The instruction is rigorous in character, and on a level comparable to that of 4-year collegiate institutions.

14. The credential given to graduates may take the form of a diploma or certificate, or that of an associate degree. Usually the associate degree requires somewhat more in general education courses than is required for the diploma or certificate.

An Office of Education study in 1957 showed 252 institutions which reported organized occupational curriculums of the engineering related type with a full time enrollment of over 38,000 students. The growth in the number and importance of these institutions reflects a demand for semi-professional workers to assist and support professional workers.

Between 1950 and 1960 the occupational group of professional, technical and kindred workers in the United States grew by 47 percent. During the same period our experienced work force grew by only 15 percent, reflecting the rapid pace of scientific and technological change that dominates our age. The number of technicians increased 142 percent during the decade with the largest increase in electrical and electronic technicians (680 percent).

New types of educational programs usually originate in private schools, which have more freedom for experimental programs than publicly supported institutions. Technical institute education started in private institutions and for many years private institutions provided most technician training. The private school helps to carry the burden of the total load, yet its contribution is usually more in the form of qualitative service than in the training of large numbers of persons. The large mass of the training sooner or later is taken over by public institutions, supported by taxation. As needs became more evident, publicly supported engineering colleges entered the field, establishing technical institute divisions. Later, technical institute type curriculums emerged in community colleges and area vocational-technical schools or were established directly as State-supported technical institutes.

In recent years few private technical institutes have come into being, in contrast to the large growth publicly-supported institutions which are better able to meet the growing needs for trained technicians.

The 1963 study[12] found that 34 percent of the electronic, engineering and physical science technicians had formal training in the technical institutes. Of this group, almost 25 percent had been trained by the Armed Forces, 17.5 percent through correspondence courses and some 4.4 percent in junior colleges. In the medical and dental technician fields, more than 40 percent of the training has been provided by the Armed Forces, 7 percent in technical institutes, 7 percent in junior colleges, and 40 percent in special schools.

About three-fourths of the technicians claimed to have learned their current jobs through on-the-job training. More than a third of the technicians stated that on-the-job training was the most helpful way in which their jobs were learned.

The junior college which has developed from two directions—upward from the high school, and downward from the university—often is related to the technical institute. It is a distinctly American institution, designed initially to help bridge the gap between high school and college, and to make higher education available to more persons at lower cost to the student. Initial activity came in private institutions, and spread to publicly supported programs growing out of secondary schools. The Joliet Junior College, getting under way in 1901, is generally recognized as the first public junior college. California soon became active in the field, with the establishment of Fresno Junior College in 1910, followed rapidly by Santa Barbara, Los Angeles, Bakersfield and Fullerton. State legislation in 1917 gave impetus to the growth in California.

The junior college movement was well under way by 1920, and the first meeting of the American Association of Junior Colleges was held in 1921. As the movement developed, and the scope of curricula offerings widened to give increased emphasis on occupational education, many of the leaders felt that the title "junior college" was not really indicative of its breadth of activity. After some search for a new title, the term "community college" came into use. Although a large number of institutions call themselves junior colleges, the use of the newer title appears to be expanding rapidly.

From the private single purpose technical institute, technician training has spread to other institutions with varying organizational structures. An important role in technical education at the sub-professional level is now played by the community college. Emerging from the junior college which was developed to meet the needs for additional facilities for higher education in the liberal arts, the community college now provides a wide range of activities for youth and adults.

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[12] Formal Occupational Training of Adult Workers, op. cit.

The vocational education program that was discussed earlier has become a more important source of trained technicians in recent years. Each year a substantial number of persons enter work life in the technical field directly after completing a high school program of technical education. They come from specialized technical schools or from comprehensive high schools, which offer technical training. In either case students usually have completed a rigorous program, with substantial portions of mathematics, science and drawing. The curriculum followed may have been somewhat general, including technological subject matter in several fields, or it may have been specialized—with subject matter limited to a single field. Graduates usually enter industrial life at the lower levels of engineering technician occupations.

The objective of the technical high school program is two-fold: preparation for entrance to engineering college, and preparation for work life at the technician level. The well-planned school has separate curriculums for meeting these two objectives: a broad curriculum for engineering college preparation, a specialized curriculum for students whose objective is entrance upon work life immediately upon graduation. The college entrance curriculum provides the mathematics and science required for engineering college admission, and often includes foreign language. The vocational-technical curriculum includes the mathematics, science, and a liberal portion of shop and laboratory activity pertinent to the specialized technical field. Both curriculums provide the usual courses in English, social studies, general science, and physical education required of all high school students.

Most technicians have entered their jobs through means other than full-time preemployment training programs. They have learned what was needed while working —through self study, through correspondence study, and through organized courses made available outside working hours.

In some ways the service rendered by technician training institutions through evening and other part-time classes is more important than services provided for full-time students. Many thousands of workers are only partially prepared for their jobs, and thousands more aspire to jobs acquiring additional training. It would be uneconomical and unwise for most of these persons to leave their jobs and undertake full-time study. They must, therefore, get the training needed while they are still working. The programs offered by the training institutions in the evening, and at other times outside of working hours, make it possible for these persons to reach their desired goals.

Some workers must acquire new skills on their current jobs just to keep pace with changing technology and changing job requirements. Others have gaps in their training background—basic mathematics, science, etc.—which they would like

to fill. Some are interested in preparing themselves for work quite different from their present employment, and are willing to attend evening classes for several years, if necessary, to get the training needed. Some attend part-time classes to prepare themselves for technical specialty jobs that require only short training programs. The range of needs is great, and a wide variety of educational offerings is required to meet these needs, presenting a challenge to the technical training institution requiring educational vision on the part of the school administrator far beyond that needed to operate a full-time day training program.

The Armed Forces play an important role in providing technical training to workers in the United States. The Armed Forces use formal schools as well as on-the-job training for occupations at skilled and technical levels. In some cases a man is given a basic course in a selected field, put to work in a low level job, and later given advanced instruction. In 1960 the Army was reported to have 35 different schools offering more than 500 technical courses. In fiscal year 1961 some 51,000 persons received training for technican ratings in Navy schools. The U.S. Air Force has many military occupations of a highly specialized type requiring broad technical background for specialized training. The military necessity for the Armed Forces technical training is evident and is a large contribution to the skills of the civilian labor force.

Not long ago much of the work done today by technicians was performed by engineers. Many of these engineers performed technician tasks as part of their duties throughout their engineering careers. To some extent this practice persists today. Some persons trained in engineering colleges find technician tasks more to their liking than the more theoretical work of engineering. The pay for technician jobs approaches that of engineers, especially in the earlier years of the person's work life. Not long ago the starting pay for a well-trained technician in many cases exceeded that of the beginning engineer.

The training received by the engineer gives him sufficient basic training in mathematics, science and technology for the technician job, yet his training does not provide the manipulative skills or the specific technology required for many technician occupations. As the market becomes better supplied with graduates of technical institute type programs who are better prepared for the jobs than the engineering graduate, there may be a tendency for industry to prefer these graduates instead of those from engineering colleges. With the rapidly expanding opportunities in technician employment, there is little danger that placement opportunities for engineering graduates in this field will be curtailed to any great degree.

Considerable stimulation has been given to technician training by the National Defense Education Act of 1958 and the Vocational Education Act of 1963. Support from federal funds has been given to developing the post-secondary training courses on an area wide basis. The growth of area vocational schools of the technical institute character with the use of federal resources may be the forthcoming major development in the structure of technical training in the United States.

The vast numbers of trade schools throughout the United States are proprietory in nature like many technical institutes. These schools supply a wide variety of skills such as accountants, barbers, artists, hairdressers, practical nurses, office machine operators, and secretaries. Such schools usually must meet minimum standards prescribed by States.

6. Training for Full Employment

A new emphasis has been introduced into job training in the United States during this decade of the 60's. The core of this new emphasis on training has been provided by the Manpower Development and Training Act of 1962 (MDTA), although numerous other legislative enactments since 1960 support the same philosophy of using training to overcome our social and economic problem and encourage economic development. The Area Redevelopment Act of 1961 introduced the principle of Federal support to programs for retaining workers for employment. The Vocational Education Act of 1963 contains much of the new philosophy respecting job training. The Economic Opportunity Act of 1964 which is the basic legislation in our anti-poverty program provides for a variety of extensive training activities. Supported by Federal funds these new programs require cooperation, initiative and often funding from State and local resources in their implementation.

The Manpower Development and Training Act (MDTA) authorized a national program of occupational training and basic manpower research and experimentation—all directed toward helping the American worker to develop to the fullest his skills and potentials and to find his place as a contributor to the economy.

The matching of men and jobs is still an imperfect process because there is always a disparity between the requirements of jobs and the qualifications of jobseekers. As a result, labor shortages exist while at the same time workers are looking for jobs but are unable to find employment.

During 4 years of operation, the MDTA program has demonstrated that it is an effective instrument to provide the underemployed with the opportunity to upgrade their skills and to equip the unemployed with new skills required by a changing job market.[29] The basic education provision of the act also has helped workers to qualify for and benefit from occupational training.

The manpower research and experimentation provisions have stimulated a series of investigations into such problems as the motivation of workers in seeking training and jobs, the methods used by workers to find jobs, the shifting occupational patterns of the economy, and the discovery of better ways of helping disadvantaged persons through training and other manpower services. Recognizing that job opportunities and workers may be separated geographically, the act permits experimentation with various techniques to increase worker mobility.

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[29] 1966 Report of the Secretary of Labor on *Manpower Research and Training under MDTA.*

The needs of the unemployed—the young and old, nonwhite and otherwise disadvantaged—continue to call for action. And so does the Nation's need for trained workers. MDTA training is helping to meet these needs.

In 1965 the MDTA program enrolled 180,000 trainees, of whom 110,000 completed training. Of those who completed training, 74 percent are employed. Experimental and demonstration projects are utilizing new techniques to reach, counsel, and train the disadvantaged individuals not adequately aided through established channels and methods. Research projects are exploring new avenues and ideas to find solutions to crucial manpower problems.

National concern about youth unemployment and the social ills that may develop therefrom has led to a notable series of programs aimed at meeting youth needs. It is also one of the reasons for the great educational legislation recently enacted by the Congress.

Several segments of the War on Poverty—the Job Corps, the out-of-school program of the Neighborhood Youth Corps (NYC), the youth services of the Community Action Program—are aimed basically at rehabilitation of out-of-school youth. By providing opportunities for work experience, these programs seek to repair deep-rooted cultural and personal handicaps and educational and training deficiencies in the younger members of our work force.

The Neighborhood Youth Corps, while serving its primary purpose of rehabilitation, has at the same time provided jobs for youth. In the summer of 1965, NYC work-experience projects employed almost 300,000 of the young people then flooding into the job market.

Still more important in developing jobs for youth was the 1965 Youth Opportunity Campaign launched by the President. He asked employers to provide a million additional employment opportunities for young men and women last summer, and this challenge was successfully met. The youth services of the Federal-State Employment Service have also been greatly strengthened—another long step forward in job development efforts and counseling and placement services for youth.

The Neighborhood Youth Corps provides work experience for disadvantaged youth from low-income families which will enable them to:

- Stay in school.
- Return to school if they have already dropped out.
- Obtain work experience and develop good work habits if they are out of school and out of work.

Operated by State and local governments and private nonprofit agencies on contract with the Federal Government, the projects employ youth aged 16 to 21 in a variety of jobs where they will help to meet unmet public needs and will not displace present workers.

The Job Corps is a residential training program for youth out of school and out of work, whose lives have been so underprivileged that they have little chance of becoming productive citizens without a change of surroundings.

The maximum length of enrollment is 2 years, but most courses are designed for completion in a shorter period. Corpsmen may leave at any time; enrollment is wholly voluntary.

The first center began operations in early 1965. By mid-January 1966, the Job Corps had 73 conservation centers, with over 8,000 enrollees; 8 urban centers for men, with another 8,000 enrollees; and 6 urban centers for women, with 1,500 enrollees. Plans call for an increase in the total enrollment in all centers to 30,000 by the end of fiscal year 1966 and to 45,000 by the end of fiscal year 1967.

The Community Action Program (CAP), which is a central part of the War on Poverty, is designed to stimulate and support overall planning and action against poverty by local communities. This program is local, comprehensive, and selective. It is local in the sense that it is firmly grounded in the principle of local community management of its programs and establishment of goals; comprehensive in that it seeks to address a broad range of programs; and selective in that it deals with specific target groups of disadvantaged people.

Federal CAP projects are now in operation in all 50 of the larg st cities in in the United States as well as in many smaller communities and rural areas. These projects are generally confined to inner-city slum areas and isolated pockets of rural areas where poverty is acute. Some projects are aimed at particular age groups; others concentrate on providing reading, skill training, cultural enrichment, health services, or other types of specialized assistance in particular fields. Still others are intended to establish an institutional framework within which other programs can operate more effectively.

These projects mount an integrated attack on current problems. They make services available not only to adults but also to children and young people, to help them to become independent, productive adults by attending today to their physical and psychological well-being.

The Department of Labor is also moving ahead with a community program of Human Resources Development to aid individuals in groups with the highest unemployment rates and least ability to compete for the jobs that are available. A Labor Department Selected Cities Task Force has been established to determine the general guidelines to be followed in conducting the Human Resources Development Program. Members of the Task Force have been assigned specific responsibility as "city coordinators" for the Department's manpower programs in 21 major metropolitan areas. As programs develop and needs arise, "city coordinators" will be assigned to additional areas. Their principal objectives are: (1) to determine how the total departmental resources can be most effectively directed toward solving the specific employment and training problems of the unemployed in each city and (2) to speed up action on new manpower programs and services for the disadvantaged groups and hard-core unemployed.

The MDTA experimental and demonstration (E & D) program is the spearhead of innovation in training of disadvantaged youth and adults who cannot be reached, motivated, or prepared for jobs by the regular training programs. E & D projects, conducted by private or public agencies on contract with the Department of Labor, have pioneered in developing techniques now widely used in the special youth programs and also in training of adults.

The E & D projects concerned with youth have experimented with at least five different training approaches. One of these is the sheltered workshop, where trainees help to produce marketable goods. Under constant supervision and as nearly realistic industrial conditions as possible, they are introduced to such basic job requirements as regular attendance, cooperation with fellow workers, and acceptance of supervision. A standard work pace is set to indicate the need for sustained work and the relation of work performance to pay. However, poor performance does not trigger disciplinary action.

Skill centers have been created by several E & D youth projects. These centers create as realistic a work setting as possible, but the goods and services produced by the trainees are not marketed.

Vestibule training is a third E & D approach designed to prepare youth for specific entry jobs. In one project sponsored by a city government, trainees were prepared for clerical, hospital, and other jobs, through a combination of vestibule training in city government agencies and classroom education. Of the 327 youth who entered the program, most of whom were unemployed high school graduates, 197 were placed in training-related jobs and 83 in other kinds of jobs. Only 36 were terminated and 11 were awaiting placement at the time of the report.

On-the-job training by a private employer, provided for in a number of projects, gives enrollees the advantage of learning in an actual work situation at wages substantially higher than the MDTA youth allowance. The project sponsors (with reimbursement from MDTA funds) furnish counseling and other services and handle all arrangements with the employer providing the on-the-job training.

A fifth approach has been pre-apprenticeship training, aimed at upgrading the knowledge and skill of school dropouts to meet the standards required for apprenticeship. Enrollees have been given a combination of OJT and supplementary classroom instruction, carefully adjusted to the requirements of the particular trade involved and the trainee's academic deficiencies. The results, though not uniformly favorable, demonstrate that school dropouts who would never otherwise have had an opportunity for apprenticeship may, by successfully completing a year of coupled OJT and classroom instruction, gain admittance to formal apprenticeships in the construction and metal-working trades.

These and other new programs for using training as a device for aiding the matching of jobs and people form what is commonly referred to as an active manpower program. In this context, job training is not a function and responsibility of a single department or office or of one level of government as opposed to another. Job training remains the primary responsibility of the individual but not his responsibility only. Job training is both a private and public function in the United States. In summary, it is the function and responsibility of our entire society.

7. Trends and Conclusion

In this decade, we are taking a long range look at our training programs for all workers because our educational and training requirements are undergoing rapid changes. Therefore, any dogmatic statement about the organization and structure of job training in the United States is likely to contain some untruths. We know, however, that the levels of educational attainment of our work force are rising each year. We know that more training is necessary to insure that the worker will have a job and will participate in our society. Since a similar growth of technology of scientific applications of knowledge and skill are taking place throughout the world, other countries are confronted with problems similar to ours. The structure for the administration of training programs must, therefore, be flexible and imaginative programs devised to meet the needs for economic growth and development.

The trend toward greater educational attainment of the individual has been reinformed by a tendency toward greater formalization of training in the United States. Between 1930 and 1964 enrollment in institutions of higher education increased four-fold in the United States. This is indicative of the growing emphasis being given to education and training in our country. With more resources being devoted to education and training this year, there is a greater need to examine the costs and benefits of this activity. Training programs must be made more effective. Research that will help us improve our training programs must be undertaken. We are investing considerable resources in research to improve our training abilities and expect to have better information on training techniques and methods in a few years. Our hope for an improved life and the aspirations of a Great Society depend upon effective training opportunities for all.

TABLE A

Enrollment in Federally-Aided Vocational Classes, by Type of Program, Selected Years

Fiscal Year	Total	Agriculture	Distributive Occupations	Home Economics	Trades and Industry[1]	Practical Nursing	Technical Education
			Number (in thousands)				
1918	164.2	15.5	—	30.8	117.9	—	—
1948	2,836.1	640.8	292.9	1,139.8	762.6	—	—
1959	3,701.1	757.2	310.6	1,585.9	968.1	30.8	48.6
1960	3,768.1	796.2	303.8	1,588.1	938.5	40.2	101.3
1961	3,855.6	805.3	306.1	1,610.3	963.6	47.3	123.0
1962	4,072.7	822.7	321.1	1,725.7	1,005.4	49.0	148.9
1963	4,217.2	827.8	309.6	1,839.4	1,001.8	54.0	184.6
1964	4,566.4	860.6	334.1	2,022.1	1,069.3	59.0	221.2
			Percent Distribution				
1918	100.0	9.4	—	18.8	71.8	—	—
1948	100.0	22.6	10.3	40.2	26.9	—	—
1959	100.0	20.5	8.4	42.8	26.2	0.8	1.3
1960	100.0	21.1	8.1	42.1	24.9	1.1	2.7
1961	100.0	20.9	7.9	41.8	25.0	1.2	3.2
1962	100.0	20.2	7.9	42.4	24.7	1.2	3.7
1963	100.0	19.6	7.3	43.6	23.8	1.3	4.4
1964	100.0	18.8	7.3	44.3	23.4	1.3	4.8

[1] Includes enrollment in fishery occupations.

SOURCE: U.S. Department of Health, Education, and Welfare, Office of Education.

TABLE B

TOTALS FOR ALL TRADES, TRENDS 1941-1964

Registered Apprentices in Training, New Registrations, Completions and Cancellations
(Adjusted to account for reporting revisions)

Year	In training on January 1, ...	New Registrations[2]	Completions	Cancellations[2]	In training on December 31, ...
1941	18,300	14,177	1,289	5,051	26,137
1942	26,137	20,701	2,011	4,683	40,144
1943	40,144	11,661	1,715	6,975	43,115
1944	43,115	7,775	2,122	8,197	40,571
1945	40,571	23,040	1,568	5,078	56,965
1946	56,965	84,730	2,042	8,436	131,217
1947	131,217	94,238	7,311	25,190	192,954
1948	192,954	85,918	13,375	35,117	230,380
1949	230,380	66,745	25,045	41,257	230,823
1950	230,823	60,186	38,533	49,747	202,729
1951	202,729	63,881	38,754	56,845	171,011
*1952	172,477	62,842	33,098	43,689	158,532
1953	158,532	73,620	28,561	43,333	160,258
1954	160,258	58,939	27,383	33,139	158,675
1955	158,675	67,265	24,795	26,423	174,722
1956	174,722	74,062	27,231	33,416	188,137
*1957	189,684	59,638	30,356	33,275	185,691
1958	185,691	49,569	30,647	26,918	177,695
1959	177,695	66,230	37,375	40,545	166,005
*1960	172,161	54,100	31,727	33,406	161,128
1961	161,128	49,482	28,547	26,414	155,649
1962	155,649	55,590	25,918	26,434	158,887
1963	158,887	57,204	26,029	26,744	163,318
1964	163,318	59,960	25,744	27,001	170,533
1965	170,533				

* Major revisions in reporting system effected this year.

[2] Includes reinstatements.

[3] *Cancellations* are not synonymous with "dropouts," since they include layoffs, discharges, out-of-state transfers, upgrading within certain trades, and suspensions for military service, as well as voluntary "quits."

SOURCE: U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training, Division of Research and Cooperating State Apprenticeship Agencies.

TABLE 1. All Ways and Most Helpful Way of Learning Current Job,[1] by Current Occupation, April 1963-

(Percent distribution of civilian workers 22 to 64 years old who completed less than 3 years of college)

Current occupation[1]	Total in occupation	No training needed	All ways of learning[2]				Most helpful way of learning									
							Formal training			On-the-job learning			Casual methods			
			Formal training[3]	On-the-job learning	Casual methods[5]	Not available	School	Apprenticeship	Armed Forces	On-the-job instruction	Company training courses	Worked way up	From friend or relative	Picked it up	Other	Not available
Craftsmen, foremen, and kindred workers - Continued																
Construction craftsmen Con.																
Other construction craftsmen	100.0	1.1	34.1	59.1	68.8	2.3	....	14.8	3.4	27.9	....	1.1	9.1	17.0	1.1	24.4
Cranemen, derrickmen, and hoistmen	100.0	1.7	17.5	60.0	49.2	1.7	....	....	7.5	35.0	4.2	4.2	5.8	23.3	3.3	15.0
Foremen (n.e.c.)	100.0	.6	32.7	83.7	36.4	.8	4.5	4.3	2.3	26.3	4.3	20.0	1.6	13.8	.5	21.7
Manufacturing	100.0	....	32.6	85.9	33.8	1.3	3.8	3.4	2.0	25.6	5.3	23.4	1.0	12.7	.7	22.1
Durable goods	100.0	....	33.2	87.8	38.1	1.4	2.3	4.0	1.2	27.6	5.4	22.4	1.2	13.6	.5	21.9
Nondurable goods	100.0	....	31.8	82.8	27.0	1.1	6.2	2.6	3.3	22.6	5.1	24.8	.7	11.3	1.1	22.3
All other industries	100.0	1.8	33.0	79.6	41.4	....	5.8	6.0	2.9	27.5	2.6	13.9	2.6	16.0	....	20.9
Linemen and servicemen, telegraph, telephone, and power	100.0	2.5	55.0	94.7	30.7	....	1.2	9.9	1.6	38.5	21.1	5.9	1.2	5.0	....	13.0
Machinists	100.0	....	56.1	78.9	36.6	.5	10.4	19.7	1.3	28.8	4.7	2.6	.5	9.4	1.0	21.6
Mechanics and repairmen	100.0	2.5	43.4	60.0	52.4	.5	9.2	2.3	3.8	25.4	5.6	2.1	5.8	21.8	2.7	18.9
Airplane	100.0	....	72.6	84.1	31.9	....	16.8	2.7	8.8	23.0	4.4	1.8	1.8	10.6	1.8	28.3
Auto	100.0	1.4	40.5	48.1	61.9	1.0	8.3	1.6	4.4	21.3	5.2	2.1	10.3	27.5	3.0	14.8
Radio and television	100.0	....	86.3	49.0	30.4	....	48.0	2.0	11.8	8.8	4.9	....	2.0	6.9	4.9	10.8
All other	100.0	3.6	38.7	65.7	50.7	.3	5.6	2.8	2.2	29.4	6.0	2.4	3.8	20.8	2.4	21.1
Stationary engineers	100.0	4.2	39.5	73.7	33.5	1.8	12.0	1.2	7.2	27.5	....	7.2	1.8	9.0	4.2	25.7
Toolmakers, and die makers and setters	100.0	4.4	64.6	55.2	32.6	....	8.8	32.6	....	17.1	2.8	4.4	1.1	11.0	1.7	16.0
All other craftsmen and kindred workers	100.0	1.4	34.2	69.7	41.3	1.4	3.5	8.8	.4	35.7	3.3	6.6	6.5	13.9	1.3	18.7
Operatives and kindred workers	100.0	8.6	12.9	61.8	42.6	1.2	2.8	.9	.8	41.4	3.8	2.3	4.4	22.1	1.3	11.6
Assemblers	100.0	6.9	11.9	81.2	28.4	.3	2.6	....	.6	63.9	3.8	.5	.6	13.5	.8	6.7
Attendants, auto service and parking	100.0	13.0	14.4	43.8	58.7	1.0	1.4	....	2.9	25.0	6.2	....	2.4	39.4	1.0	8.7
Bus drivers	100.0	11.1	14.2	52.1	41.6	....	2.1	....	....	18.4	21.6	1.1	3.7	25.3	6.8	10.0
Checkers, examiners, and inspectors, manufacturing	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Deliverymen and routemen	100.0	7.8	13.0	57.8	49.1	.9	5.1	.4	2.6	55.3	5.7	2.6	1.5	7.0	.6	14.7
Dressmakers and seamstresses, except factory	100.0	3.1	21.0	25.3	81.5	....	10.5	....	....	11.1	1.2	....	11.7	45.7	6.2	10.5
Filers, grinders, and polishers, metal	100.0	7.9	13.3	66.1	39.4	....	3.0	....	....	49.1	1.8	1.8	1.2	25.5	....	9.7
Laundry and drycleaning operatives	100.0	12.5	12.7	48.7	59.8	....	.8	....	....	31.2	1.7	2.0	9.3	30.3	.6	11.6
Meatcutters except slaughter and packing house	100.0	....	36.0	57.7	49.2	1.6	5.3	9.5	1.1	34.4	4.2	....	11.1	15.3	3.7	15.3
Mine operatives and laborers (n.e.c.)	100.0	16.0	3.5	52.0	50.0	....	....	1.0	....	29.0	1.0	5.0	4.5	27.5	1.5	14.5
Packers and wrappers (n.e.c.)	100.0	13.6	4.8	60.2	41.6	1.1	.5	....	....	41.6	2.0	1.1	2.5	21.5	.9	16.3
Painters, except construction and maintenance	100.0	7.6	13.6	47.5	56.8	1.7	5.9	3.4	1.7	27.1	....	2.5	3.4	32.2	....	16.1
Sewers and stichers, manufacturing	100.0	3.2	12.4	60.2	40.3	1.5	5.1	1.3	....	47.3	5.3	.7	7.7	21.2	1.9	6.3
Taxicab drivers and chauffeurs	100.0	24.6	14.5	29.7	49.3	2.9	....	....	1.4	13.8	5.8	2.2	5.1	26.8	2.2	18.1
Truck and tractor drivers	100.0	17.5	7.6	32.5	61.2	2.4	.7	.1	1.8	15.9	1.7	2.0	6.3	39.5	1.7	12.9
Welders and flame-cutters	100.0	4.2	41.3	62.4	34.9	....	15.1	1.8	1.8	30.7	7.7	2.1	4.8	15.6	1.9	14.3
Other operatives	100.0	5.1	17.6	71.4	36.6	1.9	1.7	3.2	1.9	43.6	6.0	4.0	5.5	13.3	1.2	14.4
Operatives and kindred workers (n.e.c.)	100.0	6.6	11.3	71.7	30.0	1.0	2.3	.9	.3	51.7	2.7	3.0	3.0	17.8	.9	10.7
Manufacturing	100.0	6.4	10.8	73.8	30.5	.9	2.2	1.0	.2	54.2	2.8	2.9	2.7	16.6	.8	10.3
Durable goods	100.0	6.5	14.1	74.6	34.8	.8	3.1	1.4	.2	54.6	2.3	1.9	2.3	15.9	.7	11.1
Furniture and fixtures	100.0	14.8	18.3	58.3	36.5	3.5	6.1	....	....	41.7	1.7	1.7	7.0	16.5	....	10.4
Stone, clay, and glass products	100.0	12.6	4.6	68.2	31.0	1.3	....	1.3	...	53.6	2.0	4.6	3.3	12.6	....	9.9
Primary metal industries	100.0	4.3	13.0	75.5	32.0	1.6	1.1	2.2	1.1	50.0	3.8	4.9	....	15.8	1.1	15.8
Fabricated metal products	100.0	5.0	12.3	82.2	31.0	.9	1.5	.9	....	62.0	.6	.9	2.6	12.6	.6	13.4
Machinery, except electrical	100.0	7.1	29.4	72.0	32.8	.7	4.7	5.7	....	48.3	.7	2.7	1.0	15.2	....	14.5
Electrical machinery, equipment, and supplies	100.0	3.4	13.3	84.3	22.0	....	4.4	....	.7	71.3	3.1	.7	1.4	8.2	.7	6.1
Transportation equipment[6]	100.0	4.9	14.6	77.2	42.1	....	6.5	....	....	56.5	1.2	....	....	16.7	1.2	13.0
Motor vehicles and motor vehicle equipment	100.0	6.7	6.7	80.6	37.0	....	2.8	....	....	65.5	....	....	....	11.7	1.7	11.7
Other durable goods	100.0	7.1	5.5	65.9	48.0	.6	1.0	.6	....	42.9	5.2	1.9	5.2	28.2	1.6	6.2
Nondurable goods	100.0	6.2	7.4	73.0	34.1	.9	1.2	.5	.1	53.8	3.4	3.9	3.1	17.4	.9	9.5
Food and kindred products	100.0	6.7	5.5	67.0	37.4	.7	.7	...	.5	52.6	3.2	3.0	2.2	23.3	.7	7.0
Textile mill products	100.0	1.7	8.7	82.6	21.8	1.0	2.1	.7	.....	66.0	2.4	1.0	7.6	7.3	1.0	10.1
Apparel and other fabricated textile products	100.0	8.7	8.3	63.0	31.2	1.9	3.0	1.1	....	51.7	.8	1.9	3.8	21.9	....	7.2

See footnotes at end of table.

TABLE 2. All Ways and Most Helpful Way of Learning Current Job,[1] by Current Occupation, April 1963-

-(Percent distribution of civilian workers 22 to 64 years old who completed less than 3 years of college)

Current occupation[1]	Total in occupation	No training needed	All ways of learning[2]				Most helpful way of learning									
							Formal training			On-the-job learning			Casual methods			
			Formal training[3]	On the-job learning[4]	Casual methods[5]	Not available	School	Apprenticeship	Armed Forces	On-the-job instruction	Company training course	Worked way up	From friend or relative	Picked it up	Other	Not available
Operatives and kindred workers - Continued																
Operatives and kindred workers (n.e.c.) - Con.																
Manufacturing - Continued																
Nondurable goods - Con.																
Paper and allied products	100.0	7.1	3.8	78.6	33.6	....	.8	.8	....	50.0	2.1	12.6	1.7	17.7	....	7.1
Chemicals and allied products	100.0	2.9	9.7	84.6	26.9	1.1	....	....	....	58.3	5.7	8.0	1.1	12.0	1.1	10.9
Rubber and miscellaneous plastic products	100.0	10.1	8.2	65.8	30.4	....	1.3	....	....	54.4	4.4	1.3	....	19.6	4.4	4.4
Leather and leather products	100.0	9.2	2.3	68.2	45.7	1.2	1.2	....	....	42.2	1.7	1.2	4.0	19.7	....	20.8
Other nondurable goods	100.0	4.3	16.0	78.4	28.4	1.2	....	1.2	....	50.6	10.5	2.5	2.5	14.2	1.2	13.0
Nonmanufacturing	100.0	8.5	14.1	57.8	46.2	1.9	3.4	.4	1.6	35.3	1.4	4.1	4.6	25.9	1.2	13.7
Private household workers	100.0	27.9	10.3	9.3	56.4	5.5	4.4	....	.7	4.8	.1	.5	13.9	31.9	2.5	27.9
Baby sitters	100.0	48.9	11.7	12.2	30.6	5.0	5.7	....	....	8.3	....	....	4.4	22.2	1.1	48.9
Housekeepers	100.0	19.1	13.6	20.0	63.6	4.5	4.5	....	....	6.4	....	4.5	7.3	37.3	4.5	19.1
All other private household workers	100.0	25.7	9.9	7.9	59.3	5.7	4.1	....	.8	4.2	.2	.2	15.8	32.8	2.5	25.7
Service workers, except private household	100.0	13.5	24.6	45.5	42.7	2.3	10.6	.7	1.1	25.9	4.0	1.4	4.3	23.7	2.2	13.5
Attendants, hospital and other institutions	100.0	5.3	38.8	76.2	29.0	.7	10.3	....	2.7	48.3	7.8	2.2	.4	10.0	2.0	5.3
Attendants, professional and personal service (n.e.c.) and recreation and amusement	100.0	15.7	14.0	38.8	61.2	.8	8.3	....	....	24.8	2.5	....	1.7	38.0	....	15.7
Barbers	100.0	1.4	84.8	23.4	26.2	1.4	38.6	18.6	....	6.9	....	....	6.2	4.8	....	1.4
Bartenders	100.0	7.1	8.8	30.1	54.9	8.0	4.4	....	....	20.4	....	4.4	3.5	41.6	1.8	7.1
Chambermaids and maids, except private household	100.0	19.3	11.4	38.6	45.2	2.4	2.4	....	....	25.9	4.8	1.2	7.8	30.7	....	7.8
Charwomen and cleaners	100.0	28.7	2.3	25.5	52.8	2.3	1.4	....	....	16.2	.9	....	3.7	41.7	.9	6.5
Cooks, except private household	100.0	20.8	32.3	41.8	59.8	1.9	1.9	....	3.0	21.6	1.6	2.6	10.4	37.1	2.2	11.9
Counter and fountain workers	100.0	1.4	87.8	26.5	12.7	....	68.5	2.2	....	9.1	....	.8	.6	4.4	1.4	11.6
Hairdressers and cosmetologists	100.0	13.0	15.3	47.3	42.7	2.3	5.3	....	....	26.7	5.3	1.5	6.1	27.5	1.5	13.0
Housekeepers and stewards, except private household	100.0	22.4	7.2	36.0	50.4	3.6	2.6	....	....	22.4	2.1	.9	3.6	31.8	.9	13.4
Janitors and sextons	100.0	25.4	4.8	34.7	44.3	3.0	1.8	....	2.1	22.8	1.5	.6	6.0	29.0	1.2	9.6
Kitchen workers (n.e.c.) except private household	100.0	37.3	4.9	22.5	47.2	1.4	2.1	1.4	....	14.1	1.4	....	4.9	27.5	....	11.3
Porters	100.0	2.3	72.9	54.2	28.2	.8	35.5	....	.8	31.7	.8	.8	.8	7.2	4.2	16.0
Practical nurses	100.0	....	42.2	79.5	23.0	8.1	6.2	....	3.7	28.0	19.3	5.6	....	5.0	6.2	26.1
Firemen	100.0	14.6	15.5	62.6	29.1	3.4	6.8	....	4.4	35.9	8.7	1.5	1.0	11.2	....	16.0
Guards, watchmen, and doorkeepers	100.0	2.4	55.2	79.9	31.9	.7	12.2	1.0	3.1	21.2	18.7	3.1	.7	8.0	8.7	20.8
Policemen and detectives	100.0	14.2	5.2	42.3	55.8	1.9	1.3	....	....	30.8	2.8	.3	5.6	35.2	1.9	7.8
Waiters and waitresses	100.0	21.8	14.3	42.3	41.9	3.8	5.0	....	....	26.6	3.0	1.6	6.2	17.8	4.0	13.9
All other service workers	100.0	17.7	11.1	19.2	64.8	5.4	2.6	.2	.4	13.2	.2	.3	13.5	30.4	4.7	16.9
Farm laborers and foremen	100.0	18.6	13.3	11.4	64.7	6.5	3.9	.5	....	5.8	.5	....	17.9	26.1	7.2	19.6
Farm laborers, unpaid family workers	100.0	17.3	9.9	23.4	64.9	4.8	1.9	....	.6	17.2	....	.4	11.1	32.6	3.4	15.5
All other farm laborers and foremen	100.0	18.1	6.9	40.0	50.5	2.3	1.7	.4	.9	26.6	1.2	1.8	5.1	31.4	1.4	11.3
Laborers, except farm and mine	100.0	20.6	5.8	32.8	51.9	1.6	1.1	....	1.1	23.3	....	3.2	1.6	34.4	....	14.8
Gardeners, except farm, and groundskeepers	100.0	20.5	....	9.8	75.9	1.8	....	....	....	1.8	....	....	29.5	38.4	....	9.8
Lumbermen, raftsmen, and wood choppers	100.0	13.1	5.6	41.5	54.8	3.2	....	....	....	27.0	1.5	2.1	6.2	36.4	3.0	10.7
Other laborers	100.0	18.9	7.7	42.0	48.0	2.1	2.2	.5	1.2	28.2	1.4	1.7	3.8	29.6	1.3	11.3
Laborers (n.e.c)	100.0	18.4	5.1	47.3	44.6	3.1	.8	....	1.1	32.1	1.1	2.2	1.8	27.6	1.7	13.1
Manufacturing	100.0	19.7	6.0	48.5	45.4	2.4	.9	....	1.3	29.6	1.3	3.1	1.8	27.9	1.5	12.8
Durable goods	100.0	21.6	8.3	49.5	39.4	4.1	.9	....	2.8	28.4	1.8	5.0	1.4	23.4	.9	13.8
Metal Industries	100.0	17.9	3.8	47.4	50.9	.9	.9	....	....	30.8	.9	1.3	2.1	32.1	2.1	12.0
Other durable goods	100.00	16.2	3.5	45.2	43.2	4.2	.8	....	.8	36.3	.8	.8	1.9	27.0	1.9	13.5
Nondurable goods	100.00	19.2	9.2	39.2	49.8	1.6	3.0	.8	1.2	26.1	1.5	1.4	4.8	30.6	1.0	10.3
Nonmanufacturing	100.0	13.4	11.5	41.3	55.0	.7	3.7	1.6	1.0	28.8	.3	.7	4.4	35.3	1.0	9.7
Construction	100.0	25.2	6.8	37.0	44.4	2.6	2.3	....	1.4	23.3	2.7	2.1	5.3	25.8	1.1	10.9
Other nonmanufacturing																

1 Last job if unemployed.

2 Since some persons indicated more than one way, sums of ways, when added to "No training needed," exceed 100.0 percent.

3 Includes school (company training school only if training was full-time for at least 6 weeks), apprenticeship, and Armed Forces.

4 Includes on-the-job instruction by supervisors or fellow workers, company training courses (part-time, or full-time for less than 6 weeks), and "worked way up by promotion."

5 Includes "learned from friend or relative", "just picked it up", and other methods.

6 Includes occupations not shown separately.

TABLE 3. All Ways and Most Helpful Way of Learning Current Job,[1] by Current Occupation, April 1963

(Percent distribution of civilian workers 22 to 64 years old who completed less than 3 years of college)

Current occupation[1]	Total in occupation	No training needed	All ways of learning[2]				Most helpful way of learning									
							Formal training			On-the-job learning			Casual methods			
			Formal training[3]	On-the-job learning[4]	Casual methods[5]	Not available	School	Apprenticeship	Armed Forces	On-the-job instruction	Company training course	Worked way up	From friend or relative	Picked it up	Other	Not available
Total, all occupations	100.0	7.5	30.2	56.2	45.4	1.6	8.7	2.0	1.2	29.6	3.6	3.9	6.0	20.4	2.5	14.6
Professional, technical, and kindred workers	100.0	2.1	64.6	66.7	33.2	1.2	25.2	2.0	2.5	24.9	4.3	5.7	2.3	6.4	8.7	16.0
Accountants and auditors	100.0	.8	61.2	80.2	28.9	.8	24.8	.8	.8	26.5	1.2	10.7	.8	10.7	2.1	20.7
Draftsmen	100.0	....	77.4	84.8	26.3	.9	26.3	6.5	5.5	37.3	2.3	3.2	....	.9	5.1	12.9
Engineers	100.0	1.2	70.4	80.8	34.0	.6	20.4	4.1	4.1	24.9	5.0	10.1	.6	6.5	6.5	16.6
Nurses, professional	100.0	1.8	92.1	38.7	22.4	.5	54.5	.5	11.5	11.4	.8	....	....	....	16.8	13.7
Teachers, except college	100.0	6.8	55.8	41.5	27.9	6.8	29.9	....	1.4	19.0	....	2.0	6.8	2.0	10.9	21.1
Technicians, electrical and electronic and other engineering and physical sciences	100.0	4.7	54.2	83.5	30.2	....	10.8	1.9	7.1	34.4	6.1	5.2	.9	2.4	2.8	23.6
Other technicians (n.e.c.)	100.0	2.2	54.4	73.5	23.5	....	25.0	....	3.7	36.8	5.9	1.5	....	2.9	5.1	16.9
All other professional technical, and kindred workers	100.0	2.1	53.9	64.8	43.1	1.4	17.0	1.6	1.3	24.3	6.8	7.0	4.6	11.5	10.1	13.7
Farmers and farm managers	100.0	8.4	20.6	17.6	79.7	4.0	3.4	.1	.6	7.3	.3	.4	30.5	23.9	5.8	19.2
Managers, officials, and proprietors, except farm	100.0	4.0	36.2	57.1	55.7	1.2	7.8	1.6	1.8	20.8	3.3	9.2	8.5	24.0	3.3	15.7
Buyers and department heads, store	100.0	2.6	35.2	83.3	35.7	.9	9.7	.9	.9	25.6	4.0	23.3	....	15.9	3.1	14.1
Officials and administrators (n.e.c), public administration	100.0	12.7	51.5	72.4	43.3	....	15.7	....	1.5	28.4	....	9.7	1.5	11.9	5.2	13.4
Managers, officials, and proprietors (n.e.c)	100.0	3.7	36.2	54.3	58.0	1.3	7.4	1.8	1.8	19.9	3.6	8.2	9.6	25.0	3.4	15.5
Construction	100.0	.7	44.1	61.8	65.3	1.5	7.0	8.1	1.3	22.7	.4	4.6	15.9	17.9	1.1	20.3
Manufacturing	100.0	.7	46.4	71.4	50.8	1.3	10.9	2.1	2.7	26.0	2.1	13.4	5.6	16.6	5.0	14.9
Transportation and public utilities	100.0	.8	41.6	70.6	50.8	.8	9.5	1.5	1.9	17.9	9.2	13.4	6.1	22.9	1.9	14.9
Wholesale and retail trade	100.0	5.4	26.4	45.9	63.1	1.2	5.1	.5	1.4	18.6	3.5	6.9	10.7	31.3	3.2	13.4
Banking, insurance and real estate	100.0	1.5	54.3	81.0	30.4	.9	9.8	....	1.8	26.1	12.6	12.6	.9	7.7	2.8	24.2
All other industries	100.0	5.7	38.6	40.4	60.7	1.5	9.1	1.9	2.1	14.6	1.5	5.9	11.5	27.8	4.4	15.5
cials	100.0	4.8	32.9	68.3	44.5	1.7	7.6	.7	2.4	28.0	..	....	....	....	2.1	10.5
Clerical and kindred workers	100.0	2.0	53.6	71.4	29.5	.7	21.7	.2	.4	37.9	4.1	4.9	1.6	9.9	1.9	15.3
Agents	100.0	1.9	47.7	70.1	48.6	....	13.1	....	....	25.2	10.3	7.5	11.2	9.3	2.8	18.7
Bank tellers	100.0	....	44.1	96.6	10.2	....	4.2	....	....	69.5	2.5	5.9	1.7	1.7	....	14.4
Bookkeepers	100.0	1.8	64.4	61.6	34.3	.2	26.6	.2	.1	36.7	2.0	3.5	3.3	9.7	2.1	13.9
Cashiers	100.0	5.1	23.3	66.6	37.6	1.5	5.7	....	1.2	43.9	6.0	3.0	2.4	20.3	....	12.5
Mail carriers	100.0	4.3	13.5	80.8	23.6	1.4	2.9	....	....	64.4	1.0	3.4	1.0	8.7	4.3	10.1
Office machine operators	100.0	....	58.9	76.5	14.3	.6	25.6	....	....	38.1	15.2	2.1	....	2.1	2.1	14.9
Payroll and timekeeping clerks	100.0	....	59.2	93.1	21.5	....	15.4	....	....	50.8	3.8	3.8	....	3.8	2.3	20.0
Postal clerks	100.0	3.6	17.9	80.5	30.8	2.6	7.7	1.0	1.0	46.7	3.6	1.5	1.0	11.3	1.5	21.0
Receptionists	100.0	2.2	67.4	57.0	35.6	....	25.2	....	....	31.1	3.7	5.9	.7	18.5	3.7	8.9
Secretaries	100.0	1.3	85.5	60.8	24.6	.2	50.1	....	.2	21.7	.9	4.6	.6	5.2	1.3	13.9
Shipping and receiving clerks	100.0	6.2	7.8	64.8	42.6	3.5	.8	....	1.6	37.9	1.6	8.2	2.3	21.9	.8	18.8
Stenographers	100.0	....	94.1	66.2	9.6	....	54.4	....	....	19.9	1.5	4.4	....	3.7	....	16.2
Stock clerks and storekeepers	100.0	9.1	15.3	67.9	46.7	.7	4.9	1.0	1.7	37.3	.7	3.8	1.7	21.3	1.4	17.1
Telephone operators	100.0	1.2	32.5	90.0	14.5	.8	4.8	....	....	43.4	21.7	2.8	....	6.4	2.0	17.7
Typists	100.0	....	85.5	66.2	25.2	.4	41.0	....	.4	29.5	1.1	3.0	.4	8.1	1.9	14.5
All other clerical workers	100 0	1.6	45.5	78.1	31.7	.8	11.4	.4	.4	43.8	4.7	6.6	1.8	10.7	2.3	16.2
Sales workers	100.0	7.5	23.4	60.2	47.4	1.0	5.1	.2	.4	30.8	8.2	4.2	3.5	23.8	3.5	12.7
Insurance agents, brokers and underwriters	100.0	....	51.5	84.7	33.6	.9	3.1	.9	.9	38.4	18.3	.9	1.3	11.4	5.2	19.6
Real estate agents and brokers	100.0	2.0	49.3	45.9	56.8	1.4	22.3	....	....	15.5	2.7	....	2.0	23.0	13.5	18.9
Salesmen and salesclerks (n.e.c.)[6]	100.0	8.5	19.1	58.7	49.1	.9	4.2	.2	.4	30.9	6.6	4.8	4.0	25.4	2.8	12.1
Manufacturing	100.0	2.9	33.5	67.3	46.5	2.4	5.7	1.2	2.0	30.6	6.9	11.8	4.5	17.6	2.9	13.9
Wholesale trade	100.0	4.8	28.2	72.8	51.0	....	2.4	.7	.7	26.9	9.2	11.2	3.7	19.7	4.8	16.0
Retail trade	100.0	9.7	15.7	54.9	49.8	.9	4.3	....	.1	31.6	6.2	2.7	4.2	27.8	2.5	10.9
All other sales workers	100.0	7.1	26.1	61.5	36.7	2.2	6.6	....	.9	31.9	18.1	4.0	.9	19.0	3.1	8.4
Craftsmen, foremen, and kindred workers	100.0	1.8	40.6	64.8	47.5	.8	6.0	8.3	2.4	27.6	3.9	5.5	6.2	17.9	1.6	18.9
Bakers	100.0	1.8	21.6	56.8	46.8	1.8	4.5	9.0	....	38.7	1.8	6.3	8.1	20.7	....	9.0
Compositors and typesetters	100.0	....	73.3	65.7	25.7	....	19.0	25.7	....	28.6	1.9	6.7	....	8.6	....	9.5
Construction craftsmen	100.0	1.7	39.4	54.8	57.2	.9	4.3	11.0	2.2	24.8	.9	2.2	10.5	21.9	1.5	19.0
Brickmasons, stonemasons, and tilesetters	100.0	2.5	44.7	56.6	53.5	....	6.9	12.6	....	27.7	....	1.3	15.1	13.2	....	20.8
Carpenters	100.0	2.8	31.1	48.7	67.8	.6	2.4	7.0	2.3	21.9	1.2	2.3	14.2	28.1	1.7	16.2
Electricians	100.0	....	72.9	71.2	33.4	....	10.7	20.5	4.9	24.9	1.9	2.2	1.9	6.6	1.4	24.9
Excavating, grading, and road machinery operators	100.0	2.2	11.2	47.0	72.2	1.0	.6	.6	2.6	23.6	....	3.2	8.6	40.6	3.5	14.4
Painters	100.0	1.9	27.8	46.9	58.7	.5	5.4	12.0	.5	22.9	.9	1.2	17.2	21.5	....	16.5
Plumbers and pipefitters	100.0	.7	55.0	66.6	39.1	2.6	3.0	15.6	.7	35.1	....	2.3	5.3	10.3	2.0	25.1
Tinsmiths, coppersmiths, and sheetmetal workers	100.0	....	70.9	58.1	44.4	1.7	10.3	13.7	4.3	20.5	1.7	4.3	....	27.4	1.7	16.2

See footnotes at end of table.

PRINTING TRADES CLASSES, PERTH TECHNICAL COLLEGE